In particular, Claim 1 recites:

> 1. A method of receiving a signal in the presence of noise and interference comprising the steps of:
> demodulating the signal when a relationship between the signal and the noise and the interference meets a criterion; and
> <u>jointly demodulating the signal when the relationship between the signal and the noise and the interference does not meet the criterion</u>.
> (Emphasis added.)

The new Official Action contends that Serizawa et al. discloses a joint demodulator in Figure 16 in the form of the "first demodulator (with adaptive equalizer)" **202**. However, Applicant respectfully submits that Serizawa et al.'s first demodulator with adaptive equalizer **202** is not a joint demodulator. In particular, as described in the present application, for example at Page 1, lines 6-9:

> Joint demodulation is widely used to detect a desired signal from a received signal that includes an interfering signal as well. In joint demodulation, the desired signal and the interfering signal are both demodulated based on information concerning the desired signal and the interfering signal, so as to obtain a better estimate of the desired signal.

Page 1, lines 10-25 of the present application cites six references which extensively describe joint demodulation.

In sharp contrast, Serizawa et al. discloses a demodulator that incorporates an adaptive equalizer. See Serizawa et al. Column 14, lines 20-34:

> In this embodiment, the demodulation apparatus comprises: a distributor **200** for distributing a received input signal into two passages; <u>a first demodulator 202 incorporating an adaptive equalizer</u> which is connected with one of the two passages coming from the distributor **200**; a second demodulator **204** without an adaptive equalizer which is connected with the other one of the two passages coming from the distributor **200**; a matched filter **208** for filtering the received input signal; a multipath detection unit **210** for detecting a presence of the multipath; and a selective output unit **206** for selectively outputting one of the outputs of the first and second demodulators **202** and **204** by connecting an output of one of the first and second demodulators **202** and **204** while disconnecting the other one. (Emphasis added.)

An adaptive equalizer is simply not a joint demodulator. For example, as defined in the Serizawa et al. patent itself at Column 8, lines 1-6:

> The first demodulator **102** incorporates the adaptive equalizer capable of compensating the communication path distortion due to the presence of multipath, <u>and obtains a digital signal by demodulating the received input</u>

> signal after the communication path distortion is compensated. (Emphasis added.)

More specifically, in an adaptive equalizer, the weighting in the equalizer taps can be adaptively changed. Again, see, for example, the Serizawa et al. patent, Column 2, lines 24-31:

> For instance, in a case of an adaptive equalizer using an RLS algorithm, setting a number of taps to be 5, and taking the coefficients between 3 to 5, because (3 to 5)$\times 5^2$ =75 to 125, at most 123 complex multiplications have to be performed. Since the differential demodulator requires only one complex multiplication, this implies that the adaptive equalizer can consume up to 125 times greater power than the differential demodulator.

In view of the above, Applicant respectfully submits that a reasonable interpretation of Serizawa et al. does not describe or suggest the use of an adaptive equalizer.

Nor does Petrus supply the missing teaching. As acknowledged by Paragraph 1 at Page 2 of the Detailed Action "Petrus teaches estimation of a signal to interference in noise ratio (SINR) as a criterion in determining a further step." However, as noted in the Abstract of Petrus:

> A method and apparatus is described for implementing adaptive smart antenna processing in a receiving communication station that includes an array of antennas and means for adaptive smart antenna processing, the method and apparatus including determining weight vectors for the adaptive smart antenna processing. Using the invention offers advantages when operating in a low SINR environment, for example, in a mobile environment in which the remote users are travelling at high speeds, hence the signals undergo fading. One aspect is hybrid weight adaptation that starts off with a method with good convergence properties, for example, one known to converge in a low SINR environment then switches to a method that converges rapidly, for example when started with relatively high quality initial conditions. To deal with high mobility, the weights determined from data at a particular burst are applied on that particular burst. Such weights may not be optimal for the subsequent bursts. When several users are present in a given channel, a multiport architecture is used to track each individual remote user. (Emphasis added.)

Thus, Petrus uses an SINR threshold at Block **311** to determine whether to apply constant modulus adaptation (Block **313**) or decision directed adaptation (Block **317**), but does not contain any suggestion to apply SINR considerations to the determination of whether to perform demodulation or joint demodulation. However, there is no description or suggestion in Serizawa et al. or Ranta et al. to use a criteria to decide whether to demodulator or jointly demodulate the signal.

Finally, even if the references were combined, the combination would not describe or suggest the recitations of Claim 1. In particular, if the references were combined, demodulation with adaptive equalization or without adaptive equalization would be used, as in Serizawa et al., but SINR would be used to determine whether to use constant modulus adaptation or decision-directed adaptation as in Petrus. The combination would not describe or suggest the recitations of Claim 1.

For at least these reasons, Claim 1 is patentable over Serizawa et al. in view of Petrus. Claim 3 is patentable at least per the patentability of Claim 1 from which it depends. Claims 19 and 21 are system analogs of Claims 1 and 3, and are patentable for the same reasons that were described above.

In conclusion, Applicant again wishes to thank the Examiner for the continued thorough examination and for the continued indication that all but four of the claims are allowable. As shown above, however, these four claims are patentable over the cited references. Accordingly, Applicant respectfully requests reconsideration of the outstanding rejections and allowance of the present application.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on May 15, 2003.

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Date of Signature: May 15, 2003